METHOD FOR VISUAL TRACKING USING SWITCHING LINEAR DYNAMIC SYSTEM MODELS

ABSTRACT OF THE DISCLOSURE

5   A target in a sequence of measurements is tracked by modeling the target with a switching linear dynamic system (SLDS) having a plurality of dynamic models. Each dynamic model is associated with a switching state such that a model is selected when its associated switching state is true. A set of continuous state estimates is determined for a given measurement, and for each possible switching

10   state. A state transition record is then determined by determining and recording, for a given measurement and for each possible switching state, an optimal previous switching state, based on the measurement sequence, where the optimal previous switching state optimizes a transition probability based on the set of continuous state estimates. A measurement model of the target is fitted to the measurement

15   sequence. The measurement model is the description of the influence of the state on the measurement. It couples what is observed to the estimated target. Finally, a trajectory of the target is estimated from the measurement model fitting, the state transition record and parameters of the SLDS, where the estimated trajectory is a sequence of continuous state estimates of the target which correspond to the

20   measurement sequence. The set of continuous state estimates is preferably obtained through Viterbi prediction. The optimal previous switching state can be an optimal prior switching state, or can be an optimal posterior switching state.